

Message

From: Deltoral, Miguel [deltoral.miguel@epa.gov]
Sent: 4/16/2016 2:15:56 AM
To: Maraldo, Dean [Maraldo.Dean@epa.gov]; Mendez, Thomas [mendez.thomas@epa.gov]
Subject: Fwd: On The Record / Last Night's City Council Meeting /Handouts for Today's Community Meeting in Flint / Response to the Government Agencies

Miguel A. Del Toral
 Regulations Manager, GWDWB
 U.S. EPA Region 5 (WG-15J)
 77 West Jackson Blvd
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 W: (312) 886-5253

Begin forwarded message:

From: "Pressman, Jonathan" <Pressman.Jonathan@epa.gov>
Date: April 15, 2016 at 9:28:23 PM EDT
To: "Deltoral, Miguel" <deltoral.miguel@epa.gov>
Subject: Fwd: On The Record / Last Night's City Council Meeting /Handouts for Today's Community Meeting in Flint / Response to the Government Agencies

Sent from my iPhone

Begin forwarded message:

From: "Durno, Mark" <durno.mark@epa.gov>
Date: April 15, 2016 at 7:36:16 PM EDT
To: "Pressman, Jonathan" <Pressman.Jonathan@epa.gov>, "Lytle, Darren" <Lytle.Darren@epa.gov>, "Schock, Michael" <Schock.Michael@epa.gov>
Subject: FW: On The Record / Last Night's City Council Meeting /Handouts for Today's Community Meeting in Flint / Response to the Government Agencies

FYI

Mark Durno
 Homeland Security Advisor / Deputy Chief
 Emergency Response Branch
 U.S. Environmental Protection Agency
 25063 Center Ridge Road
 Westlake, OH 44145
 440-250-1743

From: Durno, Mark
Sent: Friday, April 15, 2016 7:33 PM
To: Kaplan, Robert <kaplan.robert@epa.gov>; Donnelly, Peggy <donnelly.peggy@epa.gov>; Shelly Lam <Lam.Shelly@epa.gov>; Halbur, Kathy

<halbur.kathy@epa.gov>; Bassler, Rachel <Bassler.Rachel@epa.gov>; Lippert, Jeffrey <lippert.jeffrey@epa.gov>; Kelly, Brian <kelly.brian@epa.gov>; Grantham, Nancy <Grantham.Nancy@epa.gov>

Subject: FW: On The Record / Last Night's City Council Meeting /Handouts for Today's Community Meeting in Flint / Response to the Government Agencies

The battle continues. Very good to have sound science behind us...

Mark Durno

Homeland Security Advisor / Deputy Chief
Emergency Response Branch
U.S. Environmental Protection Agency
25063 Center Ridge Road
Westlake, OH 44145
440-250-1743

From: Wells, Eden (DHHS) [mailto:WellsE3@michigan.gov]

Sent: Friday, April 15, 2016 6:57 PM

To: Johnson, Mark <johnson.mark@epa.gov>; Durno, Mark <durno.mark@epa.gov>; Dykema, Linda D. (DHHS) <DykemaL@michigan.gov>; feighnerb@michigan.gov; Brown, Melanie (DEQ) <BrownM45@michigan.gov>; Nicole.Lurie@hhs.gov; Lyon, Nick (DHHS) <LyonN2@michigan.gov>; Becker, Timothy (DHHS) <beckert1@michigan.gov>
Cc: Grijalva, Nancy (DHHS) <GrijalvaN@michigan.gov>; Granger, Patricia (DHHS) <GrangerP@michigan.gov>

Subject: Fwd: On The Record / Last Night's City Council Meeting /Handouts for Today's Community Meeting in Flint / Response to the Government Agencies

Eden V. Wells, MD, MPH, FACPM
Chief Medical Executive
Michigan Department of Health and Human Services
Tel: 517-335-8011

Sent from my iPhone, please excuse typos

Begin forwarded message:

From: Mona Hanna-Attisha <MHanna1@hurleymc.com>
Date: April 15, 2016 at 6:34:40 PM EDT
To: Eden Wells <wellse3@michigan.gov>
Subject: Fwd: On The Record / Last Night's City Council Meeting /Handouts for Today's Community Meeting in Flint / Response to the Government Agencies

Mona Hanna-Attisha MD MPH
Hurley Children's Hospital
Michigan State University

Begin forwarded message:

From: Marc Edwards <edwardsm@vt.edu>

Date: April 15, 2016 at 6:30:50 PM EDT

To: 'Scott Smith' <ssmith@waterdefense.org>, "'Dr. Mona Hanna-Attisha'" <MHanna1@hurleymc.com>

Cc: 'Melissa Mays'

<wateryoufightingfor@gmail.com>, 'Rick Carter'

<rick@michfa.org>, 'Art Reyes'

<AReyes@populardemocracy.org>, 'Amy Lange'

<amy.lange@foxtv.com>, 'Andrew Keller'

<andrew.keller@wnem.com>, 'Citizen Name / Ex. 6'

'Personal Email / Ex. 6' <@gmail.com>, 'Caresse Jackman'

<caresse.jackman@abc12.com>, 'Ilse Hayes'

<ihayes@sbgvtv.com>, "'Kane Farabaugh'"

<kfarabau@voanews.com>, 'Natalie Zarowny'

<natalie.zarowny@abc12.com>, 'Stephanie

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'Personal Email / Ex. 6' <@gmail.com>, 'Judith Zelikoff'

<Judith.Zelikoff@nyumc.org>, "'Douglas J. Fort'"

<djfort@fortlabs.com>

Subject: RE: On The Record / Last Night's City Council Meeting / Handouts for Today's Community Meeting in Flint / Response to the Government Agencies

Scott,

You are not "letting data lead the dialog." Your written public statement did not acknowledge, that these chemicals are known to be present in water heaters and showers of other U.S. cities, and are present at higher levels than Flint. If data led the dialog, you would have presented data from Flint and other U.S. cities, and said Flint is not different than other U.S. cities.

Instead, in writing, you raised unsubstantiated concerns about bathing and dangerous chemicals in Flint water, which plays off the fears of a community that has been traumatized by bad science and misinformation for 18 months from April 2015 to October 2016. Your message is not benefiting this community, but rather, is exploiting it.

When you say that the "variables and complexities of the Flint water crisis are unprecedented," what past experiences are you referring to exactly? I can't find any prior work you did on potable water distribution system problems at all. What is your precedent? How many prior water heater studies have you done? Is this your first study, and hence, it is entirely unprecedented for you? Again, a little context would be helpful here.

Do you really think the “community expects” you to run around, measuring variables everywhere, and make a public pronouncement about dangers to the public without even a viable hypothesis or putting the risks into context? If so, who, exactly, asked you to do that?

It also seems your own toxicologists, provide no basis for your claim that Flint residents have been exposed to “excess phosphate” and that it might affect their blood pressure. We did measure phosphate in every sample in March, and you know what, the levels are exactly what is planned for corrosion control, and in a range approved for safe water consumption. So I do not understand how, and why, you raise fears about high phosphate in water altering the blood pressure of Flint residents in a written statement. Why is a level of phosphate approved as an additive in every other U.S. city, suddenly a point of concern in Flint? And apparently you made that pronouncement without even knowing what the phosphate levels are? If you had asked to see the phosphate levels, I would have given them to you. If anyone from the community has asked, we would have given them out. I gave them to EPA. I gave them to MDEQ. We presented that data at a press conference. News flash: the phosphate levels are exactly as planned. So why are you shooting first and asking questions later, and issuing a health warning about phosphate exposure when you do not even know what the levels are?

I also specifically requested, that you get information from your toxicologists, about your written statement that Flint residents were in danger from waterborne lead. Where is support for that statement? Will your toxicologists provide some support for your written fear mongering about that?

Here are your final 3 points and my response.

1. There are many people in Flint experiencing serious health issues and my impression is that with all due respect you are not recognizing these problems and the possibility that something is wrong with the water in some Flint homes.

Scott, as far as I know, you came into town AFTER declaration of a water emergency that I helped to expose, by working with Flint residents. You claim that I am not recognizing these problems and the possibility that something is wrong? Where did you get that idea? Where did I ever discount the possible health harm to Flint residents? Please give me an example. I was talking about the rashes and bacteria risks, and measuring THMs, before you even came to town. I still take those risks very, very

seriously. But I have enough experience to know that there are risks in other U.S. cities that we accept.

2. Most respectfully, I totally disagree with your position that we should not question the conventional wisdom especially when our fellow Americans in Flint continue to be ill and are afraid of the water in their homes (candidly, I am taken aback by this position, especially when seeing this prior quote from you in the media: Virginia Tech engineering professor Marc Edwards, an expert on water quality, was sent to Flint to study the water supply. His team found extremely high levels of lead, and **Edwards said that authorities' actions "exposes a new level of arrogance and uncaring that I have never encountered."**

Fascinating. In case you did not notice, since I made that quote, a FEDERAL EMERGENCY HAS BEEN DECLARED. People were fired, resigned and reassigned. We have now had Detroit water since October. The state and EPA and others, are now busting their butts to get this problem fixed. If they weren't I would call them out. The state has admitted fault. While the EPA administrators have not admitted their share of the blame, their scientists and engineers are working around the clock anyway, to do the right thing. If they weren't I'd be the first to say it. Things have changed. Do you understand that?

It also fine to question the conventional wisdom, but you should at least have an underlying logical basis to do so. You should have a hypothesis, gather data, and prove it or disprove it. You should not be announcing that Flint is at risk from phosphate and airborne lead, without the slightest clue what you are talking about. That is simply spewing nonsense and disinformation- it does not qualify as "questioning the conventional wisdom."

3. I have said many times that we need more testing and data, which Water Defense is addressing because it appears the "vanguard of the conventional wisdom" is disinterested in mitigating/eliminating a health risk.

So the way you operate, is to come into town after a community has been traumatized, an emergency has been declared, and issue unfounded statements about health risks completely out of context, and then say afterwards that "we need more testing and data?" That is not how good scientists work.

I'd suggest that if you want to retain credibility, you could start by retracting your unfounded written statements about the dangers of phosphate exposure, and dangers of airborne lead from water. You could

also acknowledge that the “dangerous chemicals” you found in Flint water heaters, are also in the showers and heaters of every American home using chlorine disinfectant. You could read some basic literature on the subjects you are speaking about, so you do not spread fear and misinformation without basis. Right now I feel strongly you are not helping the community, but rather, you are exploiting it.

From: Scott Smith [mailto:ssmith@waterdefense.org]

Sent: Friday, April 15, 2016 4:40 PM

To: Mark Edwards <edwardsm@vt.edu>; Dr. Mona Hanna-Attisha <MHanna1@hurleymc.com>

Cc: Melissa Mays <wateryoufightingfor@gmail.com>;

Rick Carter <rick@michfa.org>; Art Reyes

<AReyes@populardemocracy.org>; Amy Lange

<amy.lange@foxtv.com>; Andrew Keller

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Personal Email / Ex. 6 @gmail.com>; Judith Zelikoff

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<djfort@fortlabs.com>

Subject: Re: On The Record / Last Night's City Council Meeting / Handouts for Today's Community Meeting in Flint / Response to the Government Agencies

Importance: High

Mark,

Water Defense and I are here to work for and serve the community. After several requests from Melissa Mays for me to reach out to you and since you did not return my phone call, I e-mailed you at the request of Melissa. I understand and respect how busy you are, but it was important to Melissa as one of the key community leaders (along with Rick Carter and Art Reyes whom have been copied on this e-mail chain) that I reach out to you in an effort of positive collaboration for the benefit of the Flint community.

There is no established cause and effect between levels and symptoms- but there is no denying the levels and/or presence for the chemicals of concern Water Defense measured and/or detected compared with standards or lack thereof- We are NOT establishing a cause and effect relationship, but letting the data lead the dialogue.

Water Defense is in the process of reviewing our latest round of testing data (from last weekend) and summarizing these findings and getting our findings out to the community, that is where the Water Defense focus is right now.

We believe that the complexities and variables relating to the Flint water crisis are unprecedented. With all due respect, we believed from day one of our testing that we must focus on identifying what is really in the water and air in Flint by testing for the full spectrum of chemicals (not just lead and copper) and testing the water from the entrance of the home, to the water heater, to showers/bathtubs (hot water the way people bathe/shower not just cold water). This is what the community expects from Water Defense and we work for the community and will not be sidetracked in to politics and/or dismissing health issues being raised by the Flint residents by comparing Flint shower water to other cities. With all due respect, we believe comparing Flint shower water (without complete and comprehensive testing) to other cities can lead to inaccuracies.

My statement on behalf of Water Defense issued at the community meeting (Flint Rising) is attached again to this e-mail and we stand behind that statement until we see data from actual real world testing in showers/bathes in Flint that suggests otherwise. If you read my statement in proper context, we are saying we don't know whether it is safe to shower or bathe as a general statement for the

residents of Flint because we don't have all the information needed for the residents to make an informed decision. However, what we do know, is that we found dangerous chemicals in the homes we tested and the residents of the homes we tested are exhibiting and voicing serious health concerns. I then asked Dr. Zelikoff to take our testing results and summarize possible health implications that have been published concerning these particular chemicals and the doses at which there might be cause for concern – which are attached to this e-mail and in the process of being updated for recent findings.

As to your question on phosphates here is the exact information I received from Dr. Zelikoff:

*"Hi Scott, Lead has **never been** Linked with Low blood pressure or HYPOTENSION----
However, depending on the individual and their genetic make-up, high levels of phosphate in the blood could lead to Low blood pressure based on animal studies. It works through a gene that affects kidney function and bone release of phosphate. Researchers have shown that FGF23 has a so called sodium conserving effect, meaning it controls the reabsorption of filtered sodium in the kidneys. Mice **Lacking** FGF23 excrete higher amounts of sodium in their urine, resulting in low blood pressure. Animals with high FGF23 levels show high levels of sodium in their blood, and in turn, high blood pressure. A raised level of FGF23 puts increased strain on the heart. It has been stated that "In patients with chronic renal disease, both the phosphate levels and the levels of FGF23 are chronically high. This often leads to cardiovascular disease."*

Dr. Zelikoff has also reviewed the e-mail from you below and here is her input:

"Regarding Controls- I agree that any sound scientific study requires unexposed controls. The best controls in this case would be the individuals who are demonstrating health effects themselves and the houses themselves prior to the identified lead problems- the difficulty with this, is the fact that no one is sure how long these particular exposures have been occurring and therefore how far to go back in time to come up with baseline data for these individuals. But, if baseline values for air and water exposure for the Flint community could be identified, then

the values could be compared to those presently measured by Water Defense.

Using exposure data from other cities across the nation could provide some general information. However, the most useful city to use as a control resource is one that shares the same demographics, geography, geology, etc. Otherwise, there are too many confounders that could mask any effects and/or reduce its usefulness as a control. But, it is definitely worth a try should a city nearby Flint be identified that was not impacted by Lead contamination and drinking water impacts.

Though the exposure studies you are doing and the current epidemiological studies which I presume are ongoing (or should be), cannot demonstrate cause and effect, they could, if done using sound scientific methods, produce associations between the exposures and any observed health outcomes. Any cause and effect relationships could not be done through epidemiological studies and would rely on toxicological in vivo or in vitro model systems, which need to be done as soon as possible using individual chemicals or chemical mixtures found in the drinking water or via inhalation. Another critical need, is for biological samples from the individuals with specific symptoms vs. those exposed but without symptoms vs. unexposed individuals. Useful for these human exposure studies could be blood, hair or toenail clippings for metal analyses- the toenails would provide a time estimate of exposure as residues in the toenails of Pb (for example) will go back up to 18 months.

On another note, the drinking water standards and clean air act regulations were put into place to protect individuals from health impacts that could be associated with exposure to levels that exceed these limits, particularly in the case of more vulnerable individuals such as the elderly, children, pregnant women, and those with ongoing cardiovascular or pulmonary disease. If levels measured exceed these values, despite the source of these contaminants, e.g., earth products themselves, the Flint water system, plumbing, chlorination, etc. there is a critical need to reduce those levels so as not to place any community member in harm's way." - end of Dr. Zelikoff statement.

Furthermore, Melissa Mays showed me the summary letters from VA Tech and the EPA just this last Monday and there was no mention of testing for phosphates and/or other metals in showers/bathtubs/sinks. The community is getting summary letters without detailed testing reports – Water Defense is providing detailed testing reports to the community along with summaries along with toxicology input on potential health effects. Given the feedback from Dr. Zelikoff above and the high levels of phosphates we have found in the shower/bathe water combined with reported cases of low blood pressure by Flint residents – we are letting the data lead the dialogue and providing the community with much needed information. Again, we are not afraid to admit what we don't know and are committed to doing more research and gathering comprehensive data in Flint in an effort to help the community figure out what is really going on so that solutions/interventions can be developed.

Melissa Mays has suggested a google hangout and/or conference call to openly discuss all of these issues raised in communications with you and the Water Defense team for the benefit of the Flint community. Water Defense fully supports this and will be prepared to have this call/google hangout within the next 14 days. In my opinion, this is a better forum to have an information exchange instead of more e-mails.

Since Water Defense's focus must remain on working for and with the community of Flint and doing what they reasonably ask of Water Defense , below are my summary responses to your e-mail:

1. There are many people in Flint experiencing serious health issues and my impression is that with all due respect you are not recognizing these problems and the possibility that something is wrong with the water in some Flint homes.
2. Most respectfully, I totally disagree with your position that we should not question the conventional wisdom especially when our fellow Americans in Flint continue to be ill and are afraid of the water in their homes (candidly, I am taken aback by this position, especially when seeing this prior quote from you in the media: Virginia Tech engineering professor Marc Edwards, an expert on water quality, was sent to Flint to study the water supply. His team found extremely high levels of lead, and **Edwards said that authorities' actions "exposes a new level of arrogance and uncaring that I have never encountered."**
3. I have said many times that we need more testing and data, which Water Defense is addressing

because it appears the "vanguard of the conventional wisdom" is disinterested in mitigating/eliminating a health risk.

Thanks.

Best Regards,

Scott Smith
Chief Technology Officer & Investigator
Water Defense
Twitter @WaterWarriorOne
(508) 345-6520

From: "Marc Edwards"
<edwardsm@vt.edu>
Date: April 14, 2016 at 12:19:45 AM EDT
To: "Scott Smith"
<ssmith@waterdefense.org>, "Dr. Mona Hanna-Attisha"
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Cc: "Melissa Mays"
<wateryoufightingfor@gmail.com>, "Rick Carter"
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"Judith Zelikoff"
<Judith.Zelikoff@nyumc.org>, "Douglas J. Fort"
<djfort@fortlabs.com>
Subject: RE: On The Record / Last Night's City Council Meeting / Handouts for Today's Community Meeting in Flint / Response to the Government Agencies

Hi Scott. My questions and comments are below.

>>An important point to consider is that in all of the homes tested so far we have found harmful chemicals. The disturbing health symptoms exhibited by the residents living in these homes, suggests a correlation that for these residents, it is

not safe to shower or bathe in their hot water.

Response: Harmful chemicals are in all U.S. drinking water. Both in the water coming into homes and in water heaters. One reason that they are there, is that they form as a by-product of chlorination, which is considered one of the most important public health interventions of the century. Literally, millions of people would die each year if we did not chlorinate water from fecal derived pathogens. Thousands would die from bacteria such as legionella. Thus, we accept the risk from these chemicals, even though we minimize it.

Again, in my opinion, the appropriate question is not whether harmful chemicals are there. Of course they are. The question is “Are these chemicals present at levels higher than elsewhere in the U.S.?”

How do you draw a “correlation” between these chemicals which are present in virtually all treated U.S. surface waters, very often at much higher levels than in Flint, and the disturbing health symptoms which no one is discounting? I do not see any basis for drawing a correlation, suggested or otherwise.

Are you and the rest of Water Defense, willing to accept liability, for any health harm that arises if people not currently affected by rashes and other ailments, stop bathing? Who decided that the risk from these chemicals, is more important than the health benefits from bathing? Obviously if Flint residents are getting rashes and health ailments from bathing, or think they are, they should stop engaging in that activity. But this is currently not a majority of Flint consumers.

Please note that we accept the risk of these chemicals in potable water, because the dangers of not

chlorinating, dramatically exceed the dangers of the known harmful exposure. It is not possible to make risk-free drinking water.

Furthermore, this past weekend, at WD's expense, I retained a certified, 3rd party to perform air quality testing in bathrooms when hot water is running from shower heads. There are sufficient data/evidence that harmful metals or chemicals can be released into the air from hot water and we decided that we needed this real world data; hence initiating air testing. If these metals (lead included) and chemicals are inhaled by the residents, other adverse health conditions could develop. My tests this past weekend included 3 homes (for air and more water testing) and a dorm at the University of Michigan, Flint campus (for water testing). I expect the lab reports for the last round of water tests by this Friday. The results for the air sampling tests should be available by Monday. Once I review these results with the Water Defense toxicologists, I will reach out to you to set up a conference call for the WD toxicologists, you, and me to review the WD findings and capture your thoughts.

Response: Excellent. I assume you are running appropriate controls, to test the same air without the showering in each home? And that the testing will be conducted in at least triplicate (controls and without controls) so that you can determine whether the shower significantly increased the levels in the air in each home with scientific confidence? Can you show me ANY data that suggest metal levels in air are increased as a result of showering? Finally, shouldn't you do the same tests, in Detroit or other cities with chlorination, to see if the levels in Flint are higher than other cities?

Note that the WD toxicologists are Dr. Judith Zelikoff (<http://www.med.nyu.edu/biosketch/zelik01>) and Dr. Douglas Fort

(http://www.fortlabs.com/Resume_Fort.htm). Both have impeccable reputations and Dr. Fort's latest CV is attached to this e-mail. The attached statements contain the relevant toxicology input from Dr. Zelikoff and Dr. Fort after they reviewed my testing data.

It is true that currently there are no standards for water quality used in homes for bathing or showering. In no way should the lack of standards be an excuse for inaction to resolve the water-quality problems confronted by Flint residents. When disasters reveal gaps in regulatory rules, standards, etc., it is prudent to assess the situation with real world testing and data and admit what we all don't know; which is precisely why we are testing water heaters and showers in Flint to get the data and get answers to what we don't know and fill the regulatory gaps along with nonexistent standards for bathing and showering. As an example, Dr. Zelikoff has addressed some of these gaps with the attached paper she wrote in 1993; and those gaps exist to this day when it comes to inhalation and dermal exposure of contaminated water for all chemicals via showering, which is why I shared her paper.

Response: I respectfully disagree. We have known about these gaps for two decades. The showering exposure to DBPs is well understood. It is known to be significant. Nonetheless, EPA has decided to regulate these chemicals in the distribution system. While I appreciate that you are trying to advance the science and fill this gap, would it not be important to make it clear to Flint residents, that these are risks that people outside of Flint are routinely exposed to? Wouldn't that be more fair? The impression you are creating is that this is something special in Flint alone, and it is playing on legitimate fears that residents have after 18 months of betrayal, when they were exposed to risks higher than other U.S. cities. I am concerned that without putting this into context, you are making residents believe that

something unusual is going on here, rather than what is already well known and accepted.

As Dr. Zelikoff points out in her paper from 1993 further research needs to be done on inhalation – we are now doing that research with the air testing we initiated in Flint in real world conditions and not just on theories. There are no bathing or showering standards and we believe comparisons to drinking water standards and/or testing data (including Disinfection by-products, Chloroform etc.) from water treatment plants/distribution systems and then basing conclusions downstream in bathroom showers on theories is simply not enough to declare all the water in Flint as safe for showering or bathing, especially given all the cases of health effects being reported in Flint.

Response: Again, please put this into context with what is being experienced elsewhere. DBP exposure in showers is much worse in many other cities. The DBP regulations, while not measured in showers, are likely to be roughly correlated to the risk in showers. Also, again, all of this is known, based on field data...not theories.

Given that particulate lead and other chemicals appear to be an ongoing problem in the water in Flint and testing data is varying widely in ongoing testing, this appears to be a concern and we believe we need real world air and complete water testing data before definitive conclusions are drawn and made to the public. We want nothing more than for the air testing we just did to come back with non-detects across the board.

Response: Husehold air already has some lead in it. So you need to do appropriate controls. We have done testing trying to disprove the conventional wisdom that significant lead will be mobilized from water, under some pretty extraordinary conditions. Instead, we proved just the opposite. If you prove otherwise,

that is fine, but in the meantime, is it appropriate to raise concerns that the conventional wisdom is wrong? Also, everyone is concerned about the stubbornly high levels of lead persisting in the Flint water. We just did a press conference on that yesterday.

I also shared the paper written by Dr. Andrew Whelton of Purdue that focuses on real world disaster data collected and what was learned from compromised plumbing systems in other recent contamination events. You did not address the issues and findings from Dr. Whelton's research paper in real world disasters. I am interested in hearing your opinion of the findings in this paper (attached to this e-mail), specifically on the recent recommendations from the agencies as to Flint on opening all the pipes / faucets in homes at the same time and the potential for this this to increase volatile chemical exposure via inhalation.

Response: Steve, I worked with Andy when he was a student at Virginia Tech. I reviewed his paper on flushing of organic chemicals in water heaters and am intimately familiar with that work, and I recommended it for publication. It is a fine paper examining the flushing of a chemical from plumbing due to a man-made chemical spill in West Virginia. I do not understand its relevance to the organic chemicals you are finding in Flint, which are expected to be present in homes all over the U.S.. Also, on the basis of theory and our own lab studies, levels of lead from aerosolized tap water are trivial, compared to those that can be taken up by drinking.

Please consider this simple model. If a consumer drinks a liter of water with 10 ppb lead, that is 10 ug of lead exposure. To get the same exposure in the shower, a consumer would have to inhale a liter of water, AND the drops would have to deposit into the

lungs. Only tiny amounts of water droplets are formed during showering, (please note, most steam you see is evaporated water that condenses in air and that is essentially distilled water that has no lead). You would literally drown from inhaling a liter of tap water. Consequently, consumer exposure from lead in shower droplets is thousands of times lower than exposure to lead that would be consumed in drinking water. Can you please point out the flaw in my logic above? Why is this speculation about lead in aerosolized shower air being raised at this time? It is unnecessarily alarming residents?

From: Scott Smith

<ssmith@waterdefense.org>

Date: Wednesday, April 13, 2016 at 3:35 PM

To: Mark Edwards

<edwardsm@vt.edu>, "Dr. Mona Hanna-Attisha"

<MHanna1@hurleymc.com>

Cc: Melissa Mays

<wateryoufightingfor@gmail.com>,

Rick Carter <rick@michfa.org>, Art Reyes

<AReyes@populardemocracy.org>,

Amy Lange <amy.lange@foxtv.com>,

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Citizen Name / Ex. 6 Personal Email / Ex. 6@gmail.com>, Judith

Zelikoff <Judith.Zelikoff@nyumc.org>,

"Douglas J. Fort" <difort@fortlabs.com>

Subject: Re: On The Record / Last

Night's City Council Meeting / Handouts
for Today's Community Meeting in Flint

/ Response to the Government
Agencies

Mark,

Thank you for your quick response as it is helpful to Water Defense's (WD) process for practical solutions to deliver and ensure clean water throughout the homes in Flint. WD's program is founded on collection of field data for the full spectrum of all chemicals of concern (including but not limited to testing hot water in showers). As we all agree, it is critical for the Flint residents' well being to have a comprehensive assessment of all contamination downstream (their showers/sinks, etc.) of the water distribution system for mitigation .

As previously noted, I have been on the ground performing field tests 5 out of the last 9 weekends. The WD work includes collecting samples in bathrooms/showers and the state of the water as it enters the home from the distribution system; we have tested hot water quality in an appropriate manner that captures how people bathe/shower – and we tested for the full spectrum of a chemicals, not just lead and/or copper. WD used conventional grab sampling and a cumulative/exposure method that mimics how people encounter and shower/bathe in water. WD has also tested the water heaters in these homes and the water quality/condition as it enters the home from the distribution system.

An important point to consider is that in all of the homes tested so far we have found harmful chemicals. The disturbing health symptoms exhibited by the residents living in these homes, suggests a correlation that for these residents, it is not safe to shower or bathe in their hot water.

Furthermore, this past weekend, at WD's expense, I retained a certified, 3rd party to perform air quality testing in bathrooms when hot water is running from shower heads. There are sufficient data/evidence that harmful metals or

chemicals can be released into the air from hot water and we decided that we needed this real world data; hence initiating air testing. If these metals (lead included) and chemicals are inhaled by the residents, other adverse health conditions could develop. My tests this past weekend included 3 homes (for air and more water testing) and a dorm at the University of Michigan, Flint campus (for water testing). I expect the lab reports for the last round of water tests by this Friday. The results for the air sampling tests should be available by Monday. Once I review these results with the Water Defense toxicologists, I will reach out to you to set up a conference call for the WD toxicologists, you, and me to review the WD findings and capture your thoughts.

Note that the WD toxicologists are Dr. Judith Zelikoff (<http://www.med.nyu.edu/biosketch/zelikoff01>) and Dr. Douglas Fort (http://www.fortlabs.com/Resume_Fort.htm). Both have impeccable reputations and Dr. Fort's latest CV is attached to this e-mail. The attached statements contain the relevant toxicology input from Dr. Zelikoff and Dr. Fort after they reviewed my testing data.

It is true that currently there are no standards for water quality used in homes for bathing or showering. In no way should the lack of standards be an excuse for inaction to resolve the water-quality problems confronted by Flint residents. When disasters reveal gaps in regulatory rules, standards, etc., it is prudent to assess the situation with real world testing and data and admit what we all don't know; which is precisely why we are testing water heaters and showers in Flint to get the data and get answers to what we don't know and fill the regulatory gaps along with nonexistent standards for bathing and showering. As an example, Dr. Zelikoff has addressed some of these gaps with the attached paper she wrote in 1993; and those gaps exist to this day when it comes to inhalation and dermal exposure of contaminated water for all chemicals via

showering, which is why I shared her paper.

As Dr. Zelikoff points out in her paper from 1993 further research needs to be done on inhalation – we are now doing that research with the air testing we initiated in Flint in real world conditions and not just on theories. There are no bathing or showering standards and we believe comparisons to drinking water standards and/or testing data (including Disinfection by-products, Chloroform etc.) from water treatment plants/distribution systems and then basing conclusions downstream in bathroom showers on theories is simply not enough to declare all the water in Flint as safe for showering or bathing, especially given all the cases of health effects being reported in Flint. Given that particulate lead and other chemicals appear to be an ongoing problem in the water in Flint and testing data is varying widely in ongoing testing, this appears to be a concern and we believe we need real world air and complete water testing data before definitive conclusions are drawn and made to the public. We want nothing more than for the air testing we just did to come back with non-detects across the board.

I also shared the paper written by Dr. Andrew Whelton of Purdue that focuses on real world disaster data collected and what was learned from compromised plumbing systems in other recent contamination events. You did not address the issues and findings from Dr. Whelton's research paper in real world disasters. I am interested in hearing your opinion of the findings in this paper (attached to this e-mail), specifically on the recent recommendations from the agencies as to Flint on opening all the pipes / faucets in homes at the same time and the potential for this to increase volatile chemical exposure via inhalation.

Thanks and I look forward to our conference call next week.

Best Regards,

Scott Smith
 Chief Technology Officer &
 Investigator
 Water Defense
 Twitter @WaterWarriorOne
 (508) 345-6520

From: Mark Edwards

<edwardsm@vt.edu>

Date: Wednesday, April 13, 2016 at
 2:29 AM

To: Scott Smith

<ssmith@waterdefense.org>, "Dr.
 Mona Hanna-Attisha"

<MHanna1@hurleymc.com>

Cc: Melissa Mays

<wateryoufightingfor@gmail.com>,

Rick Carter <rick@michfa.org>, Art
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Natalie Zarowny

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Subject: RE: On The Record / Last
 Night's City Council Meeting /Handouts
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Hi Scott,

Thanks for the kind words. Yes I have
 considered the dermal sorption and
 inhalation pathways carefully.

I had three comments on the work you
 sent.

First, other than lead and copper, there
 is no required monitoring for
 contaminants in homes or in water
 heaters in the U.S.. The appropriate

monitoring point for these contaminants is in the distribution system. While it is true that DBPs are often higher in water heaters, and exposure in showers is a concern, the question to me is not whether DBPs exist in Flint, but "Are they higher in Flint than in other comparable U.S. cities?" Have you done studies comparing levels of DBPs in Flint to those in other cities? On the basis of organic matter content and chlorine, is there any hypothesis why the levels would be worse in Flint than other cities? The general expectation is that water heater DBPs would be relatively low in Flint.

Second, on the PbO₂ reference you sent, the concern addressed is human exposure by lead dry dust, which is a very significant risk. If you run calculations on lead aerosol formation from water, based on measured lead in Flint water, the transport of lead via small droplets is trivial. I have done those calculations. Lead in dust and dirt is very different from lead in water, due to the very high mass of lead that is airborne. The reference you cited should not be used to support raising of health concerns about very, very, very low level exposure of consumers to lead in water via droplets.

No one is discounting the incidence of rashes or other health concerns of residents. We presented our data today that shows lead in water is still high, and that because of concerns about this, residents should continue to use bottled water and/or filters.

In terms of safety of showering and bathing, the appropriate standard to me, is not that these activities are risk free, but "Are the risks higher than other cities?"

Also, there are serious health risks from not bathing. Are you encouraging Flint residents, and by extension the residents of other cities with similar

problems, not to bath over concerns of DBPs in water heaters? On what basis are you determining that the very serious risks from not bathing, are outweighed by the risks you have cited?

I could not find the cited statements and credentials of the Water Defense toxicologists on these issues in the documents you sent. Can you send those to me, and also their phone numbers? I will try to contact them early next week after reading their written statements and backgrounds.

I will have my team send you raw results of our lead analysis that we presented today.

Best Regards,
Marc

From: Scott Smith
[mailto:ssmith@waterdefense.org]
Sent: Tuesday, April 12, 2016 9:41 AM
To: Dr. Mona Hanna-Attisha
<MHanna1@hurleymc.com>; Mark Edwards <edwardsm@vt.edu>
Cc: Melissa Mays
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Subject: On The Record / Last Night's City Council Meeting / Handouts for Today's Community Meeting in Flint / Response to the Government Agencies
Importance: High

Dr. Hanna-Attisha and Dr. Edwards,

I have been attempting to reach both of you to discuss the comprehensive Water Defense testing. I truly admire and respect your efforts, research, and work to protect the community of Flint. Water Defense believes it is important for all data and research to be transparent, considered, and reviewed in its entirety to best preserve and protect the health and well-being of all residents of Flint.

Last night, I spoke at the City Council meeting and entered my 04-09-16 statement (first attachment) into the record along with hand delivering all of the attached prior statements and scientific papers.

Note that Water Defense has done instant grab sample testing to determine the state of the water as it enters the homes, to the water heaters, to all human exposure points in sinks/bathtubs/showers. I have yet to see any of the comprehensive detailed lab reports done by the EPA and/or Virginia Tech and/or MI DEQ. I have provided the detailed Water Defense reports to the EPA and MI DEQ and would appreciate the same in return in the spirit of transparency for the best interest of the health and well-being of the residents of Flint.

I will be providing both of you with additional information from the Water Defense toxicologists and other experts that review my 3rd party testing data. The immediate concerns raised by Water Defense toxicologists are detailed in the attached information.

I am very concerned about the water heaters in schools, nursing homes, and in all residents' homes along with preponderance of health symptoms exhibited within the community from what appears to be bathing/showering. I am not aware of any other water heater testing and/or hot shower/bathtub testing for the full spectrum of chemicals (including Volatile's that can penetrate the skin via dermal absorption and/or

inhaled directly into the lungs) other than Water Defense. If you are aware of any other testing of water heaters and/or hot shower/bathtub water that was used to determine the bathtub/shower water safe for the community of Flint, please let me know as soon as possible as I am working to support the community of Flint directly on the ground here in Flint.

Please note the attached papers from Dr. Judith Zelikoff about the inhalation risks of Particulate Lead and the data collected by Dr. Andrew Whelton from recent contamination events and associated findings in plumbing systems. It may be that the flushing recommendations issued last Friday by the MI DEQ and the EPA could increase the risk of released volatile chemicals and/or aerosolized particulates that pose risks of inhalation.

Have either one of you considered the inhalation and dermal absorption human exposure pathways when making your recommendations? I am concerned about the EPA and MI DEQ comparing water treatment plant water testing data to drinking water standards only to make their determinations – as it seems that complete testing for the full spectrum of chemicals in actual bathrooms/showers and water heaters in homes along with considering all human exposure pathways of inhalation, dermal, and ingestion before affirmative declarations are made that the water is safe to shower and bathe in for all residents of Flint.

Note that Water Defense began air testing of showers (using certified 3rd parties) in bathrooms over this past weekend along with more water heater testing (with instant grab samples side by side with cumulative exposure testing developed by Water Defense). All of our water testing is done by ALS Environmental Laboratories and I look forward to comparing our detailed testing data alongside Virginia Tech, MI DEQ, and EPA.

Please see my note below from the community meeting I spoke at on Saturday.

Thanks.

Best Regards,

Scott Smith
Chief Technology Officer &
Investigator
Water Defense
Twitter @WaterWarriorOne
(508) 345-6520

From: "Scott Smith"
<ssmith@waterdefense.org>
To: "Scott Smith"
<ssmith@waterdefense.org>
Sent: Saturday, April 9, 2016
10:47:36 AM
Subject: Handouts for Today's
Community Meeting in Flint /
Response to the Government
Agencies

All,

Please see attached Statement and other handouts for Today's Community Meeting in Flint at St. Michael's Church. I will be addressing the science and facts behind Water Defense's research and testing to date in Flint at today's meeting (11:30 am, 609 E 5th Ave, Flint, MI 48503, St. Michael's Church).

Given the *Detroit News Article* this morning (link here:<http://www.detroitnews.com/story/news/michigan/flint-water-crisis/2016/04/08/group-fears-bathing-risks-flint-water/82823590/>) and the statement released yesterday by the Agencies relative to flushing pipes / particulate lead, the scientific papers attached to this e-mail from Dr. Judith Zelikoff (NYU toxicologist whom reviews my work) and Dr. Andrew Whelton (Purdue and expert in contaminated plumbing systems) point out key scientific research and facts that must be taken into consideration to preserve and protect the health and well being of the Flint residents.

Best Regards,

Scott Smith
Chief Technology Officer &
Investigator
Water Defense
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(508) 345-6520

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